

Jeremy Johnson



Bob Holden, Governor • Stephen M. Mahfood, Director

## DEPARTMENT OF NATURAL RESOURCES

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June 26, 2003

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JUN 30 2003  
RCAP

Mr. Joseph Haake  
Group Manager  
The Boeing Company  
Dept. 464C, Bldg. 220  
Mail Code S221-1400  
P.O. Box 516  
St. Louis, MO 63166-0516

RE: Comments Concerning the Additional Investigation Required to Complete the Boeing RCRA Facility Investigation (RFI), Hazelwood, Missouri; Permit# MOD00818963

Dear Mr. Haake:

The Missouri Department of Natural Resources' Hazardous Waste Program (HWP) has completed review of all documents pertaining to the RFI being conducted at the Boeing, Hazelwood Facility. This includes the following:

1. The initial RFI Report, dated June 18, 1998,
2. Investigations conducted at the SWMU 17 Area,
3. Investigations conducted at the former fabrication operations facility,
4. Investigations conducted on the Tract I South Property,
5. The Airport Authority's comments on the Tract I South Report/Split Sample Results, and
6. Boeing's April 24, 2003, response to the department's comments on the Tract I South Report/proposed additional work on Tract I South.

The following comments are the result of the review of the foregoing documents and discussions between the department, Boeing, and the Airport Authority in two meetings the week of



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June 16, 2003. The department would like to expand the focus of any additional investigation to the entire Boeing Tract I site in order to expedite the completion of the RFI Report. The following comments and recommendations must be addressed by Boeing as part of the additional investigation in order to complete the RFI and generate a final comprehensive RFI Report.

#### GENERAL COMMENTS

1. Ultimately, all of the data and information for the Tract I North and South properties need to be integrated into a comprehensive, site-wide RFI Report. Some of the contaminated areas identified as part of the more recent investigations is not associated with solid waste management units (SWMUs) identified in the RCRA Facility Assessment. These areas should be identified as areas of concern. Examples of potential areas of concern include:
  - a. Metal Cutting Recycle Area,
  - b. Metal Plating Area,
  - c. Industrial Sewer Line,
  - d. Jet Fuel Hydrant System, and
  - e. Former USTs

Contaminants of concern for the Boeing property for which soil and groundwater contamination contour maps are recommended in the Final RFI Report include the following:

- a. Perchloroethylene (PCE) and/or Trichloroethylene (TCE) and any relevant breakdown products (i.e. Cis-1,2-DCE, vinyl chloride),
- b. Total Petroleum Hydrocarbon (TPH) combining both low fraction and high fraction results,
- c. Benzene, Toluene, Ethylbenzene, Xylene (BTEX),
- d. 1,4-dioxane,
- e. Metals,
- f. Polychlorinated Biphenyls (PCBs), and
- g. Methyl tertiary butyl ether (MTBE) (it should be noted that there has only been two detections of MTBE in groundwater above ITLs at the site; one in MW-A13 located at the Jet Fuel Hydrant Area at 59 ug/L and one in TP-3 located at SWMU 13 at 1,400 ug/L. The detection in TP-3 appears to be an anomaly, MTBE has been below detection in this piezometer for the past seven quarterly sampling events (most detection limits were 1 ug/L). The only other detection have been in B28MW1 located on GKN at levels between 2.3 and 3.3 ug/L; in MW-8s at SWMU#17 (several detections, the highest being 3.2 ug/L); and in B48S2 located on Tract 1 South at 9.9 ug/L. The ITL for MTBE is 20 ug/L. There were no MTBE detections in the several hundred soil samples collected by Boeing at the site.)

Where possible, these contour maps should include an isocontour line for the respective ITL, and contour lines drawn at lower levels if supported by data detections below the ITL. If there is not enough information to accurately draw particular contours, then the line should be inferred (dashed) to the extent possible. This depiction should be based upon best professional judgement as well as known contamination. For example, if contamination is identified in two borings closely spaced, the contamination is probably present in between the borings and contour lines should be drawn accordingly. The use of visual depictions of extent of contaminants can greatly aid in the understanding of the extent of impact

2. Split sampling analytical data provided by the Airport Authority as part of the Tract I South Investigation must be included in the Final RFI Report.
3. A discussion of the USTs at this site must be included in the RFI Report. This should include underground storage tank (UST) locations, depths, tank contents, dates of removal and remediation that has taken place.
4. The United States Army Corps of Engineers (USACE) has been conducting work at two nearby sites, St. Louis Airport Site and Hazelwood Interim Storage Site. The USACE has installed numerous borings and wells at these sites and have used this information to develop a geologic model of the subsurface. Boeing is encouraged to use some of the information generated by the Corps to update the relevant geologic/hydrogeologic sections of the RFI Report. In addition, there may be an inconsistency between the direction of deep groundwater flow as measured by the USACE and Boeing. The department highly recommends that Boeing and USACE measure water elevations on the same day in the deep wells and use that data in conjunction with other pertinent geologic data collected to develop a more accurate depiction of deep groundwater flow direction across a broader area. This may aid greatly in the placement of future deep wells for monitoring purposes.
5. Well construction information for all monitoring wells pertinent to the RFI must be submitted as part of the RFI Report.
6. Historically, light non-aqueous phase liquid (LNAPL) has been identified in wells associated with former USTs at the facility. A recent survey of these wells identified two that still appear to have LNAPL in them. It appears that in some wells the water elevation was above the screened interval of the wells. This survey must be completed again at a time when the water elevation in the wells is known to be within the screened interval to further assess the presence/absence of LNAPL.

## SPECIFIC COMMENTS

### 1. Metal Cutting Recycle Area

Based upon the data collected to date, there appears to be three separate source areas for soil and groundwater TCE contamination, one in the recycle area, one under Building 27 and another groundwater TCE source area east of Building 27.

#### Data Gaps for the Metal Cutting Recycle Area

- More investigation will be necessary to determine if these three areas are all part of one large contaminant plume. Soil and/or Groundwater data is needed beneath Building 27. Because the original borings conducted in this area were associated near machine sumps, it is recommended to sample two more sumps at locations that would result in good spatial coverage. This information is needed to help assess the vapor intrusion pathway, indoor air quality, and any corresponding potential impacts.

### 2. SWMU 17

The shallow zone at SWMU 17 (both soil and groundwater) is adequately characterized for PCE related compounds including delineating the source area. This information could be used to design source removal interim action. However, there is limited data on the deep subsurface conditions at SWMU 17. Investigation of the deep zone would determine whether free product exists at the bedrock surface and determine the extent of any dissolved groundwater contamination in the deep zone. Any additional investigation should be based upon the findings of the direction of deep groundwater flow.

TPH contamination has also been identified at SWMU 17. This contamination has not been defined to the north and west of the source area. Boeing has expressed thoughts that this contamination may be migrating on-site from two underground jet fuel pipelines to the north of the site and/or from known petroleum contamination on airport property to the west of the site.

#### Data Gaps for SWMU 17

- Deep groundwater impacts must be investigated including the determination of the existence of any free product at the bedrock interface. This investigation should be completed after determining the direction of deep groundwater flow and following interim action at the source area. One boring must be installed beneath the source area

and depending on the results of this boring, a step out procedure may have to be conducted to delineate the deep contamination.

- Further investigation of the TPH contamination to the north and west of the site
- An additional soil and groundwater boring must be installed for further investigation of the former solvent UST at Building 51. This boring should be installed southeast of the former tank area.

3. Jet Fuel Hydrant System (UST Sites #2 and #4) SE of Building 48 and S of Building 45

Boeing has proposed that UST Site #2 be combined with the leaking jet fuel line and identified as one area of concern. The department agrees that this is a valid grouping of areas requiring further investigation because the contamination at both sites is TPH related. Because of the close relationship of the ramp station fuel pits, it may also be prudent to include them as part of this overarching AOC. The investigation of the jet fuel line should not be restricted to the area southwest of Building 48. More information will be necessary with respect to the partial in-place abandonment of the fuel line and any pressure testing/leak detection equipment associated with the new fuel line in lieu of further investigation of the fuel line hydrant system in areas that have not yet been investigated.

**Soil**

In the northern portion of the site Gasoline Range Organics (GRO), most likely associated with jet fuel, Diesel Range Organics (DRO), possibly associated with fuel oil, and/or jet fuel and benzene (a component of both types of TPH) are the contaminants of concern in this area. The known contaminant sources include the former UST (Fuel Oil), the jet fuel lines, and the fuel pits. TPH contamination associated with the former UST (fuel oil) has probably impacted the area deeper than the jet fuel lines, and the major shallow horizontal migration pathway for the jet fuel appears to follow the backfill of the fuel lines (3-5' bgs). It should be noted that the jet fuel lines are pressurized so there is a potential for impacting upgradient soil and significant horizontal migration following the fuel line conduit. These factors should be considered in any future delineation of the area. Step out borings conducted for benzene include B48S-2, 6, 7, 9, and 10. Step out borings conducted for GRO contamination include B48S-2, 3, 5, 6, 7, and 8. DRO was only detected in borings B48S-9 and 10. If the DRO is associated with the fuel oil UST, it appears that the major horizontal pathways are south and east along the fuel lines. Depth of any future soil samples should be restricted to the elevation of the water table.

In the southern portion of this site (fuel pits) benzene and GRO are the contaminants of concern (DRO was non detect [ND] at all locations). Step out borings for benzene and GRO that were below ITLs include B45S-1, 4, 6, 7, 8, and 9. The fuel pits (and associated

USTs) and the fuel lines to the north, west, and east are the potential sources of contamination in this area. Depth of any future soil samples should be restricted to the elevation of the water table.

### **Groundwater**

In the northern portion of the site, benzene, GRO, and DRO were detected in the water in addition to the soil. Step out borings conducted outside of these detections for benzene that were below ITLs include B48S-3W, 6W, 9W, and 10W. Step out borings conducted outside of these detections for GRO that are below ITLs include B48S-1W, 2W, 3W, 6W, and 8W. Step out borings conducted outside of these detections for DRO that are below ITLs include B48S-1W, 2W, 3W, 5W, 6W, 7W, 8W, 9W, and 10W.

In the southern portion of this area (fuel pits), benzene and GRO are the contaminants of concern (DRO was ND at all locations). Step out borings for benzene impacts that were below ITLs include B45S-1W, 4W, 6W, 8W, 9W, 10W, MW-A22, and MW-A27. Step out borings for GRO impacts that were below ITLs include B45S-1W, 3W, 4W, and 6W.

### **Data Gaps for the Jet Fuel Hydrant System**

Additional borings are required to delineate the extent of the groundwater contamination. Because TPH compounds tend to be concentrated at the water table, the investigation should focus on the top 5-10 feet of the groundwater table. This groundwater investigation needs to address the following:

In the northern portion of the area -

- One investigative boring must be installed in the area of the abandoned in place fuel distribution line to the south and east on the downgradient side of the fuel lines
- Further investigation to the west
- Provide additional historical data to supplement the investigation north of B48S-2

In the southern portion of the area -

- The investigation needs to include at least one boring immediately east of the locations of fuel pits 3 and 4 and/or data from existing wells located directly east of the fuel pits
- Further define the eastern edge of the soil benzene and TPH contamination
- Locate a soil/groundwater boring to determine if the contamination in B45S10 is migrating from the north

4. UST Site #3 Buildings 45L, C, D, and E (Hush House)

**Soil & Groundwater**

All soil and groundwater samples were ND according to Tables 5-3 and 5-4. However, free product has historically been detected in MWs A1, A2, A3, A18, A21, and 3A. The presence of free product in these wells indicates that there was a soil and/or groundwater impact in this area. This contamination must be included on maps illustrating soil and groundwater contamination.

**Data Gaps for the Hush House Area**

- The extent of free product
- Groundwater impacts for BTEX and TPH

5. Building 40 Former Drum Storage

**Soil & Groundwater**

All soil and groundwater samples were ND according to Tables 5-5 and 5-6 with the exception of B40E1W which detected TCE at 1.1 µg/L. This site needs no further investigation at this time.

6. Building 41 Tank Farm and Paint Solvent Storage

There are three types of contamination in this area, TPH (GRO, DRO, Mineral Spirits), benzene, and PCE/daughters. The extent of impacts to soil and groundwater for each of these compounds must be determined. The only impact to the deep groundwater appears to be PCE related.

**Soil and Groundwater**

DRO was detected below ITLs in the shallow soil at B41S3D and B2W1 and in the groundwater in MW-5. The closest sources for this contamination appear to be the Building 41 tank farm. TPH (identified as diesel #2 or mineral spirit range) were detected in the shallow soil at B41S3D, B2I1, B2W1, and B41N1. TPH identified as GRO and DRO (jet fuel and kerosene range) was detected in the groundwater in B41N1. The sources for this contamination could be the tank farm and/or the paint shop. Benzene was detected in the shallow soil at B41N1, B41S3D, and B2W1 and in the groundwater at B41N1 and B2W1. The closest sources for this contamination is the Building 41 drum storage and tank farm/unloading area. However, this location is flanked by MW-18 and B2N1 along the sewer line which were below ITLs. PCE related compounds were detected in shallow

groundwater in B41E1, MW-5, and B2I1 and in the deep groundwater in B41S3D. AA also detected 1,4-dioxane in MW-5 (26 µg/L) and B2W1 (380 µg/L) above the Clean-up Action Levels Missouri (CALM) Groundwater Target Concentration (GTARC) value of 3 µg/L.

#### **Data Gaps for the Building 41 and Building 2 Area**

Source area identification and delineation is an important part of site characterization. More investigation will be required in the following locations to identify and/or delineate source areas:

##### **Shallow Investigation**

- Inside of Building 2 (PCE related, 1,4-dioxane, TPH)

##### **Deep Investigation**

- More investigation of the deep PCE contamination. This should be accomplished after the deep groundwater flow direction has been adequately determined.

#### **7. Industrial Sewer Line**

The industrial sewer carried waste from the Building 52 etching operation. Contamination associated with this process includes metals and PCE related compounds.

#### **Soil and Groundwater**

PCE was detected in soil at B2N-3 and B2N-4. This is near the location of a past break in the sewer line. PCE and TCE were also detected in the groundwater at these locations above ITLs. PCE related compounds were also detected to the northeast in MW6. Metals were elevated in most soil and groundwater samples. It must be determined if the metals contamination is a soil (turbidity) or a true groundwater problem.

#### **Data Gaps for the Industrial Sewer**

- Further justification must be provided to determine if the metal exceedances are due to turbidity in the groundwater samples or represent dissolved phase mobile metals.
- Two additional shallow soil/groundwater investigative borings must be installed to determine the extent of PCE related contamination in the area of MW6. These borings should be located along the industrial sewer line near the bends in the eastern section of the Building 27 parking lot.



8. UST Area Between Buildings 4 and 5

**Soil & Groundwater**

All soil and groundwater samples were well below ITLs according to Tables 5-17 and 5-18. Because of the historical TPH concentrations in this area, MW-22 must be sampled to determine if these impacts are still present.

9. Shooting Range Bunkers

**Soil & Groundwater**

All soil sample results were below ITLs according to Tables 5-19 and 5-20. Lead and arsenic slightly exceeded the groundwater ITLs but if it can be illustrated that this contamination is not a groundwater problem (due to the turbidity of the samples) further investigation will not be necessary.

10. Former USTs

**Data Gaps for the Former USTs**

A number of USTs on the Tract I South property were closed pre-regulation. The impacts, if any, to soil and groundwater in these areas are unknown. In order to verify that gross contamination is not present, one "screening" boring should be installed east of the locations of the former USTs associated with Buildings 1 and 2 and east of the refueling area that was located west of Building 2. A stepout procedure will not be necessary at these locations if gross contamination is not present.

11. Coldwater Creek

**Data Gaps for Coldwater Creek**

After reviewing the data generated by USACE for surface water and sediment in Coldwater Creek, there is a potential that the creek has been impacted from historical operations on the Boeing Property. Sediment sample(s) should be collected between where the creek daylights north of the airport to the GKN outfall. This data can be added to data collected by the USACE to determine impacts to the creek. Contaminants of Concern include VOCs, SVOCs and TPH.

Please submit three copies of a revised work plan addendum and/or a response to comments for the Completion of the RCRA Facility Investigation addressing the above comments within 30 days of receipt of this letter. This can be an abbreviated work plan that references the original

Mr. Joseph Haake  
June 26, 2003  
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Tract 1 South Investigation and/or RFI Work Plan. If you have any questions concerning this comment letter or require any additional information, please do not hesitate to contact me at the Missouri Department of Natural Resources, HWP, P.O. Box 176, Jefferson City, MO 65102-0176, or by phone at (573) 751-3553.

Sincerely,

HAZARDOUS WASTE PROGRAM

A handwritten signature in black ink, appearing to read "P.M. Quinn", followed by a horizontal line.

Patrick Quinn  
Environmental Engineer  
Permits Section

PQ:sw

c: Ms. Joletta Golik, Airport Authority  
Mr. Jeremy Johnson, U.S. EPA Region VII ✓  
St. Louis Regional Office